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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/785,655	02/24/2004	Kenji Inoue	WASH5915	2703

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EXAMINER

SUMMONS, BARBARA

ART UNIT	PAPER NUMBER
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2817

MAIL DATE	DELIVERY MODE
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06/26/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/785,655

Applicant(s)

INOUE, KENJI

Examiner

Barbara Summons

Art Unit

2817

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1 and 13 is/are rejected.
- 7) ☒ Claim(s) 2-12 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. ____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 2/24/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____.

DETAILED ACTION

Specification

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested:

- - Duplexer Utilizing A Compact Splitter Circuit - -.

(See e.g. the specification at page 1, lines 7-9).

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claim 1 is rejected under 35 U.S.C. § 102(b) as being anticipated by Hickernell U.S. 6,201,457.

Fig. 9 of Hickernell discloses a duplexer 503 which inherently comprises: a transmit side and a receive side by definition; the transmit side having a transmit filter connected between an antenna terminal (i.e. the terminal connected to antenna 501) and a transmit terminal (i.e. the terminal connected to subsequent circuitry labeled "From Transmitter"); the receive side being of the type shown in Fig. 6 (see e.g. col. 7, lines 51-52) such that it includes a splitter circuit being notch filter 100 and a receive filter/ladder filter 105 connected in series between the antenna terminal (101 in Fig. 6) and a receive terminal (i.e. the terminal connected to subsequent filter 505 output of the

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ladder filter 105 in Fig. 6); and wherein the splitter circuit includes at least one phase line being delay line 104, which inherently affects the phase of the signal, that is connected between the antenna terminal and the receive filter 105, and at least one resonator 102 connected in parallel with the phase line 104.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 13 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Hickernell U.S. 6,201,457 in view of Wadaka et al. U.S. 5,789,845.

Hickernell discloses the invention as discussed above. However, the resonator is a surface acoustic wave (SAW) resonator rather than a film bulk acoustic resonator (FBAR).

The Examiner takes Official Notice that it would have been well known in the art that any filter concept that can be applied to SAW resonator filters can also be applied to FBAR filters because they would have been known art recognized electrical equivalent acoustic resonators. As evidence of the known electrical equivalence of SAW resonators and FBARs, the Examiner supplies Wadaka et al. (see e.g. col. 1, lines 38-43 and the drawings of FBARs and SAWs therein).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the SAW duplexer of Hickernell (Figs. 9 and 6) by having used FBARs instead of SAW resonators, because such an obvious modification would have been merely the substitution of art recognized alternative electrically equivalent acoustic resonators as would have been known by one of ordinary skill in the acoustic resonator filter art, and as suggested by Wadaka et al. (ibid.), and because FBARs would have provided the advantageous benefit of miniaturization, as also would have been known by one of ordinary skill in the art.

Allowable Subject Matter

6. Claims 2-12 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Ohashi et al. U.S. 6,937,113 discloses a SAW duplexer that uses SAW resonators TXS and RXS (see Fig. 2) as branching circuits 105 and 106 that are in series with the transmit filter and receive filter respectively.

Nakamura et al. U.S. 6,975,108 discloses a duplexer [see e.g. Fig. 17(a)] with splitter circuit comprising resonators 25 connected in series with a phase line 23, the splitter circuit being in series between an antenna terminal 27 and a receive filter 101.

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Watanabe et al. JP 7-38376 discloses a duplexer (Fig. 1) having a splitter circuit comprising a phase line 2 and two inductors 3 and 4 (or 11 and 12 depending on which branch is the receiving branch) and a SAW resonator 5/13, the splitter circuit connected in series between an antenna terminal and a receive filter 7/10 (also see the abstract).

Yamamoto et al. JP 2004-23655 discloses a duplexer having a splitter including a phase line 14, an inductor 17 and a resonator 16, all connected in series between an antenna terminal and the lower frequency filter 12 (also see the abstract).

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Barbara Summons whose telephone number is (571) 272-1771. The examiner can normally be reached on M-Th, M-Fr.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bob Pascal can be reached on (571) 271-1769. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

bs

June 21, 2007


BARBARA SUMMONS
PRIMARY EXAMINER